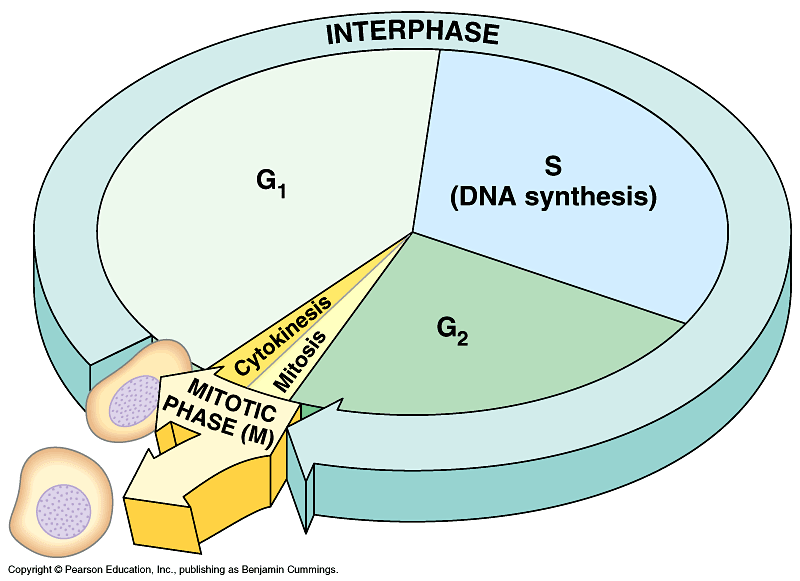
Feb 24, 2015

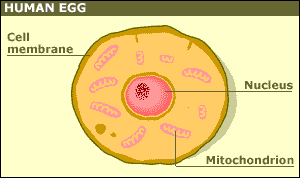
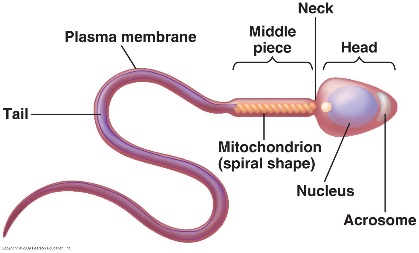
Dear Alpha Biology Students,

Good morning! You have several tasks to complete today so please stay on task! Here are your assignments:

1. **Complete review mitosis/introduction to meiosis questions. (Time = 30 min; homework if not done in class)**



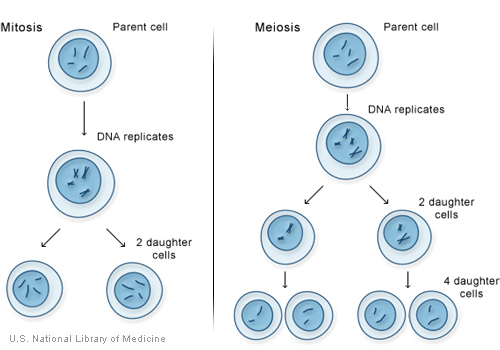
1. Earlier in the year we learned about the cell cycle. What were the three major phases of the cell cycle?
2. We learned that mitosis, followed by cytokinesis, is very important to many living organisms, including humans. Name at least two reasons mitosis and cytokinesis are so important.
3. Uncontrolled cell division is commonly known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Now let’s talk about another type of cell division - meiosis. Meiosis is the process by which gametes, egg and sperm, are created.

1. How many chromsomes does an egg have? \_\_\_\_\_\_
2. How many chromsomes does sperm have? \_\_\_\_\_\_\_

*Keep in mind….* Egg chromosomes + sperm chromosomes = 46 chromosomes (total # of chromosomes a person has)

1. Compare the two different types of cell divisions - mitosis and meiosis – using a Venn diagram



1. Do the cells created in meiosis have the same number of chromosomes as the parent cell? (Look at the pictures!)
2. Why is it important that gametes, egg and sperm, have half the number of chromosomes as all other cells have? (Think about the function of egg and sperm).
3. Watch Virtual Cell’s Meiosis animation
   1. Go to <http://youtu.be/-DLGfd-Wpr4> and complete the following:
      1. Germ-line cells undergo meiosis to produce \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ which have only one copy of each chromosome. These haploid gametes fuse to form a \_\_\_\_\_\_\_\_\_\_\_\_\_embryo that grows into the adult.
      2. There are two cell division events during meiosis. The first division, meiosis I, results in two unique daughter cells that have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the amount of DNA as the parent germ-line cell. The second division, meiosis II, results in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells that only have one copy of each chromosome. These haploid cells are the gametes that could go on to produce an offspring through sexual reproduction.
      3. Chromosomal material is exchanged between the two pairs of sister chromatids. This event is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or more commonly, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. After crossing over, the sister chromatids for each chromosome are no longer identical to one another. This is one of the reasons why \_\_\_\_\_\_\_\_\_ two \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (aside from identical twins) are genetically identical.
      4. Two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, one from the father and one from the mother, may fuse to produce a diploid embryo. The resulting embryo then grows through many cycles of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Watch Meiosis: Crossing Over and Variability [3D Animation]
   1. Go to <http://youtu.be/rqPMp0U0HOA> and answer the following:
      1. When does DNA duplicate?
      2. Name the second event that occurs that is different from what happens in mitosis.
      3. Describe crossing over.
      4. Why are siblings not identical to one another?
5. **Watch “Cracking Your Genetic Code” (Time = 60 min)**

(Link in case DVD isn’t working: https://www.youtube.com/watch?v=-hO6hmh1kBM)

1. Read the following summary of the video you are going to watch.

*What will it mean when most of us can afford to have the information in our DNA—all six billion chemical letters of it—read, stored and available for analysis? "Cracking Your Genetic Code" reveals that we stand on the verge of such a revolution. Meet a cancer patient who appears to have cheated death and a cystic fibrosis sufferer breathing easily because scientists have been able to pinpoint and neutralize the genetic abnormalities underlying their conditions. But what are the moral dilemmas raised by this new technology? Will it help or hurt us to know the diseases that may lie in our future? What if such information falls into the hands of insurance companies, employers or prospective mates? One thing is for certain: the new era of personalized, gene-based medicine is relevant to everyone, and soon you will be choosing whether to join the ranks of the DNA generation.*

1. Take notes on the following people’s stories:
   * 1. Andrew (Schmitz red-headed toddler in WI)

* + 1. Francis Collins (direction of NIH who takes three genetics tests)
    2. Katie Moser/Huntington’s disease
    3. Journalist Catherine Elton/BRAC1 gene (breast & ovarian cancer)
    4. Michael McCarrick, 27, who has cystic fibrosis
    5. Tom Garpestad, cancer
    6. Noah and Alexis Beery